

241 Large plantations of tea, coffee, rubber and
313 cinnamon have been developed, chiefly by British, in the highlands in the past hundred years, and in the forests teak provides a basic industry.

132 The rainfall is very heavy, especially in the north where the mountains encroach nearer to the sea. Through most of the area it varies between 75" and 170"; in the extreme south it drops to 32". Most of the rain comes with the southwest monsoon between May and September; lighter rains occur with the northeast monsoon in late November and December. Humidity is always very high. In most areas two wet paddy crops are taken in a year, in February and September. The temperature varies from 70° to 90°, and is hottest in April just before the monsoon breaks.

[243]

[4] (2) Political Divisions

63/ From the establishment of British supremacy in 1792, until July 1949, the Malabar Coast was divided into three political areas. In the north is the Malabar District of Madras State, in area 5,790 square miles. It is governed in internal affairs by the legislative assembly of Madras, and is under a Collector (of land revenue) who lives in Calicut, the capital of the district. The port of Cochin is also administered as part of Malabar District. In the centre was Cochin State, in area 1,493 square miles. It was governed internally by the Maharaja of Cochin, assisted by the Cochin legislative assembly, whose headquarters was in Ernakulam, the capital. In the south was Travancore State with an area of 7,625 square miles, under the Maharaja

^{5/}
[262] and milk products in the State as a result of which people have to lean more heavily on fish and tapioca.

[296] 1.36 Among the items of non-food expenditure the significant point is the higher percentage of expenditure devoted to clothing. The neatness and cleanliness of dress worn by the people of Kerala is evident even to a casual visitor to the State.

The Food Gap

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262 1.37 The superior cropping pattern has also brought with it a huge food deficit. In this, Kerala leads all the other States. The current production of foodgrains is estimated at 9.6 lakh tons, whereas requirements on the basis of a norm of 17 ozs. per day would come to about 24 lakh tons, leaving a gap of nearly 14.6 lakh tons. The width of this gap is only partially closed by the consumption of tapioca as part of the diet by poorer sections of the people, although it does form an important second line of defence in the lean years as in 1940's when there was a severe food shortage.

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433 1.38 Wide as the food gap in Kerala is, it has often led to the formulation of solutions which, if given effect to, would be retarding the operation of inherent growth factors in the Kerala economy. Every economy may present some "growth leaders", and development consists in stimulating and invigorating them. The climate and physical formation of Kerala favour the growth of a large number of valuable cash crops. It is this sector to which maximum attention should be devoted. Kerala is better suited to serve the role of an exchange economy which relies for its food requirements on the other parts of India and in return contributes to the economic development of the country by earning valuable foreign exchange through the export of raw and semi-processed commodities.

231 *Other Primary Activities*

[234] 1.39 Of the other three primary activities, viz., animal husbandry, forestry and fisheries, the former, that is, livestock is rather poorly developed. Due to the poor breed, and the natural deficiency in the livestock feed, the cattle is of poor quality with milk yields much lower than the all-India level. The only exception to this is poultry. Kerala can claim to have the best developed commercial poultry in India, the eggs produced in Kerala going even as far north as Punjab. However, in view of under-feeding and the poor conditions under which the birds are reared, there is still a lot of unexploited potential in poultry development.

313 1.40 Forestry and fishery are the two other sectors which hold an important place in the economy of Kerala. The forests in the State are rich in some of the valuable species like teak and rosewood. As a result of forest management on scientific lines and the high quality of forest growth, their yield per acre in Kerala during 1955-56 was as high as Rs. 18 against the all-India average of Rs. 5.6. This sector is crucial as a source of supply of industrial raw materials.

226 1.41 Kerala ranks foremost among the fish-producing States of India. In 1957 total fish landings in Kerala were 3.41 lakh tons. With only 10 per cent of the all-

Chapter 4

Forests

FORESTS RANK AMONG the key resources of Kerala. Estimates of the area under forests differ widely. According to the Revenue Department figures, the area under forests is 24.58 lakh acres, that is, 26.2 per cent of the total area of Kerala. According to the Forest Department, the area under its jurisdiction is 22.28 lakh acres. Private forests account for another 4.80 lakh acres thus giving a total forest area of 27.08 lakh acres (30 % of the total area). Whichever be the correct figure, it is clear that the proportion of area occupied by forests is much higher in Kerala than the average for the whole of India (17.2%).

4.2 Apart from the importance of forests as a source of raw material for the industry, and timber for other uses, forests have a moderating effect on the climate and act as a vegetal cover protecting the soil from erosion. The position in Kerala is quite satisfactory in respect of the protective function of forests. A large number of perennial tree crops like coconut, arecanut, cashewnut and rubber are also grown in the State. Their effectiveness in protection of the soil and influence on climate is as great as in the case of the forests. These perennial crops, therefore, act as a useful subsidiary to the actual forest growth.

4.3 The quality of forest growth of Kerala is also of a very high order. During 1955-56, forests contributed Rs. 5 crores,¹ that is, 1.4 per cent of the State income, which is almost double the all-India average (0.7%). Per acre yield of forests is also higher in Kerala. Whereas it was Rs. 5.6 per acre on an average for India, it was as high as Rs. 18 per acre in Kerala during 1955-56. Employment potential of forests, however, is quite meagre in relation to the area they occupy. Forests in Kerala employed only 19,000 workers, that is, 0.35 per cent of the total working force (all-India 0.4 %). Forests generally require only a few hands to work as the maintenance staff and as labour for extraction and logging.

Type of Forests and their Regional Distribution

4.4 The high yield and the large variety of important commercial species grown in the State are a consequence of the climatic and topographical features of the State. Kerala gets the benefit of south-west as well as north-east monsoons. As a result of these, the State is well assured of a good rainfall which, in addition, is fairly well

¹. Appendix 2 explains the method of calculation.

137 distributed over the year. The high degree of rainfall, old geological formation and
 132 maritime climate have largely been responsible for the luxuriant forest growth in
 Kerala. Trees get the full benefit of moisture, depth of soil and protection from
 frost and drought. For these reasons, forests in Kerala also possess the advantage of a
 long growing season.

137 4.5 Most of the forest area lies in the high ranges on the eastern border of the
 311 State and in the area adjacent to these. Only a few strips are found in the coastal
 plain. The forest area is, however, distributed over all the districts of the State.
 Since the forests run across the whole of eastern border while the districts in the State
 occur almost longitudinally, all districts, except Alleppey have a good proportion of
 their area under forests. The districts of Quilon and Trichur have as high as 45.2
 per cent and 45.1 per cent respectively of their area under forests. (Table 23)

137 4.6 The wide variations in climatic and topographical conditions in the State
 have resulted in a large variety of forests. With the exception of the desert, the truly
 temperate and the alpine types, all classes of forests are found in Kerala. In addition
 to the natural forests, Kerala has also got artificial plantations of valuable species.
 The State has been a pioneer in this sphere.

4.7 Among the natural forests, deciduous forests comprise 80 per cent of the
 growth. The rest is of the evergreen type. The evergreens are found mostly in the
 higher ranges above a height of 2,500 feet since they require a cool climate for their
 growth. The various types of forests found in the State are given below:

(1) *Evergreen Type*

- (a) Southern tropical wet evergreen forests,
- (b) Southern tropical semi-evergreen forests,
- (c) Mountain wet sub-tropical evergreen forests, and
- (d) The temperate Shola-Grasslands.

(2) *Deciduous Type*

- (a) Southern tropical wet Deciduous forests and
- (b) Tropical dry Deciduous Forests.

3/3 4.8 Among the evergreen types, most of the species are utilized in the manufacture
 222 of plywood and packing cases, which is a flourishing industry in the State. Pali
 Kulamavni and Vellapine are some of the well known plywood species. Anjali,
 which is used for boat-building and mahogany utilized for furniture, are two other
 important economic species found among the evergreens. Of late, a number of
 other evergreen species have sprung into prominence and are now finding economic
 uses. Since markets for these are growing, it is planned to extract these newer species
 also on a commercial scale.

4.9 Teak and rosewood are the most important species found among the deciduous
 forests. Vanteak, Rosewood, Poola and Charopine are some of the other important
 species belonging to this category. These species are chiefly useful in making furni-
 ture and in building and construction work. A detailed list of the trees and other
 major produce found in Kerala along with their present uses is given in Appendix 3.
 A list of minor produce is given in Appendix 6.

2. [Table 23, appearing on p. 286 of the text, has not been preserved--An.]
 2. [See pp. 329-333, category 116--Analyst]

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Artificial Plantations

4.10 As mentioned already, in addition to the natural forests, Kerala also ranks ²⁴⁵ high among the Indian States in respect of artificially raised plantations of valuable species. In fact the teak plantations were first raised in Nilambur as far back as 1842. The planting work had been regularly carried out with the result that there were about 75,000 acres under this species at the end of 1959.

4.11 Although Kerala can claim to have been a pioneer in the matter of teak plantations, a beginning with the other plantations has been made only very recently with the onset of the era of planning in the State. During the First Plan period forestry could be paid little attention. Effective beginning may, therefore, be said to have been made only during the Second Plan. Some of the plantations which have been recently started in the State are:

- (i) *Cashewnut plantations*: Covering an area of 1,100 acres.
- (ii) *Softwood plantations*: An area of 9,220 acres had been covered by the end of the Second Plan.
- (iii) *Wattle plantations*: A beginning for raising this very valuable tanbark tree has been made recently in the Hamilton Plateau of the Devicolum range.
- (iv) *Eucalyptus grandis*: Plantations of this species were started in the high ranges in Peermade and Munnar and have been showing very encouraging results. They form the raw materials for making pulp, which is used for manufacturing newspaper and rayon.

It will thus be seen that Kerala has made considerable progress in its plantation programmes and leads the other States, especially in respect of its teak plantations.

Forest Produce—Its Extraction and Utilization

4.12 Total quantity of major forest produce extracted from the forests of Kerala ³¹³ during 1958-59 through Government Agency as well as through purchasers is given below:

MAJOR FOREST PRODUCE EXTRACTED FROM KERALA, 1958-59

	Government Agency (cu. feet)	Purchasers
Rough logs	3,950,567	3,06,079 c.ft.
Rough poles	410,202	1,088 c.ft.
Sawn and Squared timber	144,802	—
Fuel	22,791	25,576 tons
Miscellaneous	1,626	Rs. 1,224,460 worth

The gross revenue through actual sales amounted to Rs. 2.44 crores and royalties on ^[434] coupes sold to purchasers earned another Rs. 0.64 crores.

4.13 Extraction and stocking in the depots are undertaken by contractors but the actual disposal is done departmentally by means of auction. Standing coupes are also

- 313 sold to purchasers for extraction of major forest produce but the extent of this is very limited in Kerala. Whereas for the whole of India about 75 per cent of major forest produce is extracted by the purchasers, in Kerala only about 15 per cent of forest is extracted by the purchasers directly, the rest being entrusted to departmental extraction.

[432] 4.14 The procedure in case of sale of timber and poles is to offer them first to the Government Departments and to sell only the surplus by open auction. The result is that while the Government Departments are able to obtain timber at reasonable negotiated rates, the trade obtains timber at very heavy rates.

4.15 In case of firewood, Messrs Forest Industries (Travancore) Ltd. (F.I.T.) have been given a concession for extraction of firewood for supply to M/s Fertilizer and Chemicals (Travancore) Ltd., Alwaye. The latter are now switching on to oil and, therefore, other uses shall have to be found for firewood extracted by the F.I.T. whose concession has still to run a number of years. Firewood supplies to the main cities come from the forest coupes which are sold to purchasers in auction after extraction of the timber. No area is managed purely for raising firewood as in some other States of India.

[651] 4.16 Unlike the major forest produce whose removal is done mainly through the Government agency, extraction of minor forest produce is mostly done through the purchasers. As may be seen from Appendix 6 Government earned only Rs. 50,000 as revenue through sale of minor produce while it earned about Rs. 5 lakhs in the form of royalties from purchasers.

Silvicultural Systems

318 4.17 Kerala is unique in having working plans for all the Government owned forest areas in the State. Since all the Government forests are managed under the latest scientific systems, there is hardly any danger of over-felling in the public sector forests.

650 4.18 With a wide variety of forests, both natural and artificial, the systems of silviculture practised are suited to the types. The Selection System¹ is the one that is being applied in all the evergreen forests and only the trees of little economic importance are extracted under the simple felling rules. The complex nature of the vegetation and difficulty of regeneration of evergreen species, together with the danger of heavy wild growth have caused these forests to be worked under the Selection System.

4.19 In the other timber forests clear-felling with natural regeneration, supplemented by artificial planting, is being undertaken. The climate and soil conditions are so favourable that there is generally no difficulty in obtaining natural regeneration. The only exception, and it is quite an important one, exists in case of the evergreen forests which are being worked more and more heavily as demand for new species arises in the market. Their regeneration is not keeping pace with the removals.

¹ Under the Selection System trees are selected for felling uniformly all over the forest. Under simple felling rules patches of forests are completely cleared in rotation irrespective of age, type or growth of trees contained in that patch.

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SOME FORESTRY PROBLEMS

Acquisition of Private Forests

4.20 It has been mentioned that forests of Kerala are one of the best managed ones. But this is true only of the reserved forests under Government jurisdiction. In the Malabar area there are about 5 lakh acres of private forests which are maintained very unsatisfactorily. Unlike the reserved forests, there is no adequate protective staff for the care of these forests and no attention is paid to their regeneration or management on scientific lines. This has naturally resulted in an unwarranted depletion of forest wealth in the private forest areas. In the interests of adequate preservation of forest wealth, immediate steps are necessary to acquire the private forests and bring them within unified forest management under the control of the Forest Department. A provision for acquiring the private forests was made during the Second Plan but their acquisition could not be carried out. This must be effected during the Third Plan period.

The Problem of Encroachment

4.21 There is one other disquieting feature about forests in Kerala. Such is the pressure of population in the State that inroads are being made into the forest areas, especially where forests occur in the midland region. This has taken the form of Government deforestation of forest areas in the interests of Grow More Food Campaign. In addition, there have also been illicit encroachments and these areas are still under cultivation, although the State Government have declared them to be revertible. The extent of these areas is not very large compared to the total area under forests. About 9,750 acres fall within the former category and 16,500 acres belong to the category of revertible areas. The gravity of the encroachment situation arises from the fact that in case a lenient view is taken, these will prove a serious menace to proper maintenance of forest potential in the long run.

Regeneration of Evergreen Forests

4.22 The problems referred to above were of an administrative nature; but forestry in Kerala is faced with one or two urgent technical problems as well. One of these is to find out some way of inducing adequate regeneration of the evergreen species.

4.23 Of late a number of evergreen species have found new uses in the manufacture of plywood logs, railway sleepers, telegraph poles, etc., and these species have all come into prominence. Full potential of the existing evergreen forests cannot, however, be tapped since their natural regeneration takes time. The forest department has, therefore, got to keep control over the working of these forests.

4.24 In case of some species because of difficulties connected with regeneration, there has been a shortage of supply. The problem of regeneration of these forests is intimately connected with the problem of light. Regeneration requires light to

- 313 be so regulated as not to disturb the present symbiosis between the plant species present. Intensive research is, therefore, urgently required to find ways and means of inducing adequate regeneration of the evergreen forests. There are at present two [65] research stations in the State at Malayathur and Nilambur. The location of a third station in the evergreen forest areas is recommended.

Eupatorium

- 137 4.25 A problem that has been engaging the attention of the Forest Department is that of the weed eupatorium. It got introduced into the State from Assam at the end of the Second World War by some ex-service men who had served in Assam. The weed has spread like wild fire throughout the State and has become a serious [65] menace. Recent research carried out by a biochemist in Trivandrum has found a use for this shrub in the manufacture of fertilisers. Further research may be carried out to find its fruitful uses.

Tribals

- * 433 4.26 A few tribes reside within the forest areas. They are allowed free grazing rights and privileges of cultivation, free of assessment. However, this does not provide 162 them with a full-time occupation. On the other hand, it is not possible to arrange 464 for their migration to midland or the coastal region because of the high pressure of population which exists in these areas. It has, therefore, been suggested in this [245] Report, that two labour colonies should be formed in grass land *sholas* where large scale planting of *Eucalyptus Grandis* is taking place. This labour force could later be employed in the proposed newsprint mills when they come up.

RECENT DEVELOPMENTS

- * 433 4.27 During the First Plan period there was no forest development scheme. A 313 beginning in forest development programmes was made only during the Second Plan. 654 An amount of Rs. 1.24 crores out of a total Plan outlay of Rs. 87 crores was earmarked for forest development plans in the Second Plan period. By the end of 1959, however, only Rs. 21.68 lakhs had been spent. The shortfall arose mainly on account of two items. The largest single item among forestry was acquisition of private forests in Malabar and for this Rs. 40.95 lakhs had been allotted. Due to procedural difficulties, this could not be undertaken and only Rs. 0.94 lakhs had been spent by the end of 1959. Secondly, although the progress of cashewnut afforestation programmes in terms of physical target has been satisfactory, as can be seen from Table 24, the cost of afforestation programmes at Rs. 24 lakhs was an over-estimate. Actual performance has been possible within Rs. 4.81 lakhs.

4.28 Table 24 gives the Plan provision and progress in execution of various schemes upto the end of 1959. Overall progress has been slow, except in the raising of plantations where the Department hopes to achieve all the targets. The slow progress [Table 24, appearing on p. 287 of the text, has not been processed] - *Andrey*

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in the early years has been due to the fact that either the sanctions from the Government were received late or the staff was not appointed in time. The shortfall in performance during the Second Plan period emphasises the need for devoting greater attention to forest development programmes during the Third Plan period. 433* 713 654

FUTURE DEVELOPMENT OF FORESTRY

4.29 Forests are an important source of raw material for industry in Kerala. Their importance is brought out by the fact that forest-based industries are more predominant in the economy of Kerala compared to the position they occupy in the industrial structure of India as a whole.¹ 433* 313

4.30 In view of the important position occupied by the forest-based industries in Kerala, the policy towards forest resources should aim at long-run enhancement of the forest potential so that an increasing surplus of raw materials could be made available to industry. Forest development policy in the State should, therefore, be guided by the following objectives :

- (i) Utilization of resources as yet untapped.
- (ii) Raising the long-run forest potential through:
 - (a) acceleration of the process of conversion of poor deciduous forests into valuable teak and softwood plantations.
 - (b) extensive reclamation of grasslands on the basis of experimental Eucalyptus plantings carried out during the Second Plan.
- (iii) Incorporation of technical improvements in the methods of logging, etc., so that wastage could be reduced. These aspects are discussed in the following paragraphs.

Existing Potential

4.31 In Kerala, the existing potential of forest resources is being exploited comparatively much better than in many other States of India. Due to easy accessibility provided by the numerous rivers and roads, many of which serve the forests, extraction has been very much facilitated. The importance of the role of river transport in exploitation of forest wealth is shown by the fact that two big centres of forest produce, viz., Kallai and Chalakudy are both located by the side of rivers. Although the general picture as regards exploitation of existing resources is quite bright, some pockets still remain untapped. These are discussed below: [505] [438]

4.32 (i) *Bamboo Resources*: In spite of a large bamboo potential in the State, this source remains completely unutilized for industrial purposes. Out of the total available supply, about two-thirds is utilized for local requirements of construction, etc. The position regarding the quantum of surplus available is as follows.

¹ See Chapter on Industries.

TECHNO-ECONOMIC SURVEY OF KERALA

AVAILABILITY OF SURPLUS BAMBOO RESOURCES

Name of Division	Government Forests		Private Forests	
	Area in acres	Field in tons of air-dry bamboo	Area in acres	Field in tons of air-dry bamboo
Wynad	18,667	38,347	..	..
Kozhikode	20,045	61,479	14,735	32,391
Nilambur	18,863	46,336	20,908	24,015
Palanghat	3,080	8,634	2,890	5,306
Nemmara	6,800	18,054	25,460	81,361
Total	67,467	172,878	64,100	143,323

Source: Department of Forests, Kerala.

4.33 Out of the above surplus, it was recently agreed to supply 1,60,000 tons to M/s Gwalior Rayons for setting up a Rayon factory. They have also been promised an additional 1,00,000 tons when the factory is in full production. The latter amount could only be made available after the private forests have been acquired by the Government. No extraction has so far been started owing to the flowering that has taken place over a wide area in the forests.

4.34 On the basis of the above estimate of available and committed supplies, there still remains a balance of about 56,000 tons which could be utilized as raw material for paper manufacture. However, the paper mill project can be undertaken only after full regeneration in the flowered areas has taken place.¹

4.35 During this interval it would be advisable to undertake surveys of other bamboo-bearing areas in the Travancore-Cochin area. At the same time efforts should be made to divert a part of bamboo at present being utilized for local requirements to industry. Far too high a proportion (about 66%) is being utilized for non-industrial uses.

3/3 4.36 (ii) *Eta Reed Resources*: The two reeds *Ochlandra travancorica* and *Ochlandra Rheedii* occur in forests of the State. These reeds are at present being supplied under a concession granted to Punalur Paper Mills Ltd. The reeds in these coupes flowered from 1953-57 and, consequently, the Punalur Mill is getting only about 5,000 tons of reeds from the allotted coupes against their annual requirements of 25,000 tons of green reeds. After full generation takes place in the flowered area, the available supply of eta reeds would be roughly 50,000 tons. The surplus of 25,000 tons may be utilized by the Punalur Paper Mills which is planning to double its present capacity during the Third Plan.

3/3 4.37 (iii) *Minor Forest Produce*: A large number of medicinal plants exist in the State. But the potential is hardly being utilized. Against a gross revenue of Rs. 3.1 crores from the forests, minor forest produce was responsible for only Rs. 5.2 lakhs, that is, 1.7 per cent. This is unlike the neighbouring States of Mysore and Madras where minor forest produce contributed a substantial part of the revenue. A phyto-chemical plant is being set up at Neriamangalam. It will require a large

¹ Further details of a paper factory are discussed in the Chapter on Industries.

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number of items of minor forest produce. It is, therefore, suggested that a proper survey of the forest areas should be conducted to assess the extent of minor forest products available in the State. This will bring out the raw material potentialities for the phyto-chemical industry as well as other small scale industries which could be based on the minor forest produce of the State. ^{433*}
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Raising the Long-run Forest Potential

4.38 There is not much scope in Kerala for extension of area under forests through afforestation programmes. There are already a number of competing claimants for land use. The proportion of area under protective vegetal cover, as discussed, is also quite adequate in Kerala. What is necessary is to minimize the extent of further in-roads into forest areas by clear felling for cultivation, etc. ^{433*}
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4.39 Having ruled out large scale afforestation as a means of improving the forest resources, the only other possible methods, to augment the forest potential are improvement in forest management and raising of new commercial plantations. Forests under the jurisdiction of the Forest Department are already being managed on scientific lines. The primary need, therefore, is the acquisition of private forests so that the standards of management could be enforced uniformly throughout the State. [656]

COMMERCIAL PLANTATIONS

Teak

4.40 In addition to the existing 75,000 acres under teak, there are 640,000 additional acres of low quality deciduous forests which are suitable for conversion into the valuable teak plantations. This changeover will considerably improve productivity of the deciduous belt. About 9,000 to 10,000 acres can be taken up every year against 2,000 to 2,500 acres being planted annually at present. The technique of raising these plantations has been perfected in Kerala and the present agri-silvicultural method, whereby the plantations are raised free of any cost to the State, may be continued. ^{433*}
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Rosewood

4.41 Rosewood is in great demand by the furniture industry. Logs of over 72" girth are also exported, mostly to Italy. The supply is getting exhausted and it is desirable to replenish the stock by raising new plantations. The tree is slow growing. It is, therefore, proposed that it should generally be raised on the periphery of the teak plantations where it can be left to grow for 2 or 3 teak rotations. There should be no extra cost as the plantations are to be raised along with teak by the agri-silvicultural method. [439]

Softwood Plantations

4.42 As a result of the difficulties in the way of regeneration of evergreen forests, the softwood species grown in these forests are in short supply. By the end of the

433 in the following table :

Type of Plantation	Third Plan		Fourth Plan		Fifth Plan	
	Physical targets (acres)	Financial targets (Rs. lakhs)	Physical targets (acres)	Financial targets (Rs. lakhs)	Physical targets (acres)	Financial targets (Rs. lakhs)
Teak	20,000	15.0	40,000	30.0	60,000	45.0
Softwood	15,000	15.0	30,000	30.0	50,000	50.0
Grassland Sholas* (Eucalyptus grandis)	10,000	75.0	15,000	102.5	—	—
Burma Bamboo*	1,000	0.5	2,000	1.0	3,000	1.5
Cashewnut	1,000	0.5	2,000	1.0	3,000	1.5
Caesura and Matchwood on Coastal Perumbavur	1,000	2.0	2,000	4.0	3,000	6.0
Wattle	3,200	7.8	—	—	—	—
TOTAL	53,200	115.8	91,000	168.9	119,000	164.9

* All grassland sholas would be afforested by the end of the Fourth Plan.

* Most of these plantations in the Fourth and Fifth Plans will be in the private forests acquired in Malabar.

SOME TECHNICAL IMPROVEMENTS

4.54 The existing logging techniques and modes of extraction entail a lot of wastage of timber. Since there is a general shortage of timber, supply of timber from the forest areas could be enhanced by incorporating some of the improvements discussed below.

Proper Seasoning Facilities

4.55 A large amount of timber at present goes waste or is used as fuel. This could be more economically utilized if proper seasoning and preservation facilities are introduced. Seasoning and preservation plants should be encouraged in all areas where there is a concentration of saw mills. This would make possible utilization of a large variety of secondary timber through upgrading them and making them commercially profitable. Government departmental rules may have to be modified to insist on the use of seasoned timber in place of the more valuable teak timber in all Government construction works.

Better Logging Techniques

4.56 The present methods of logging need to be mechanized, especially as a good network of roads exists through which mechanical saws, etc., can be taken to the actual coupes. The techniques currently employed are antiquated and involve a lot of wastage. With improved techniques, the extent of wastage could be reduced. [23] The extraction of timber by elephants in Malabar should be continued as it has proved to be cheap and quite efficient.

Forest Roads

4.57 Although in respect of overall position regarding forest roads, Kerala is comparatively better off and accessibility is quite good, there are some remote areas for which new roads are required. Opening up of these areas through forest roads would permit tapping of certain pockets of forest resources upto now lying untapped. Some of these important roads which have been suggested for being taken up during the Third Plan are :

- (a) *Roads from Dhon to Palamalai*—to tap the Chenai Nair reserved forests and to make Palamalai a summer resort.
- (b) *Extension of the Silent Valley roads to the borders of the Nilgiris district*—to tap the rich resources of the Silent Valley reserved forest and the improvement of its existing natural regeneration.
- (c) *Construction of a road from Nelliampathy Parambikulam Telikkal*. This will make Sungam and Parambikulam Ranges accessible through the Kerala territory only. At present, the State has to depend on the goodwill of the Madras Forest Department for the extraction of forest produces.

The cost of constructing these roads is estimated to be Rs. 50 lakhs.

Training Facilities

4.58 The programme for raising forest plantations can be implemented smoothly only if there is adequately trained personnel to deal with the several technical problems. At present the staff is generally deputed to Forest Colleges at Dehra Dun and Coimbatore for training. These colleges cannot, however, meet the requirements of training lower grade staff. It is, therefore, suggested that in view of the importance of forestry to Kerala, this State should have a separate training institute of its own. This institute, may be located at Peechi.

Resource Survey

4.59 For proper planning of forest-based industries, the exact extent of availability and location of different types of forest resources should be known. In the past, development has been impeded by industries being allotted more areas than was warranted by their capacity. This has thwarted development of other industries which could have utilized the surplus raw material from the forest coupes. These defects can be remedied only if a full inventory of forest resources is available. Upto now only a survey of bamboo areas has been carried out. During the Third Plan a full resource survey should be carried out.

ESTABLISHMENT REQUIRED FOR THE DEVELOPMENTS PROPOSED

4.60 If the development programmes proposed in this report are to be carried out, strengthening of the Forest Department will be necessary. Appointment of

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647 two more Conservators of Forest, one to deal with general development works of the State and the other for the new plantations may be considered. It is also proposed that an additional Chief Conservator of Forests to cope with the heavy work may be appointed as soon as the tempo of development work has gained momentum, say, by the middle of the Third Plan period. The Territorial Divisional Forest Officers should each be given a gazetted assistant to deal with all the development works in their divisions. The present annual expenditure on Establishment amounts to Rs. 8.23 lakhs (1958-59). If the above suggestions are accepted there should be an increase of about 25 per cent. It is also expected that if the tempo of developments is maintained, higher amounts will be needed in the Fourth Plan. The establishment expenditure is, therefore, worked out as under :

Third Plan period	Rs. 10.29 lakhs annually.
Fourth Plan period	Rs. 10.97 lakhs annually.

INVESTMENT AND OUTPUT IMPLICATIONS

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651 4.61 The major part of investment during the coming decade will be on raising the various commercial plantations discussed above. Investment on other items is summarized in Table appearing under Para 4.53. The amount of Rs. 3 crores¹ which is expected to be spent during the Third Plan period on acquisition of private forests, does not appear in the investment figures since the amount is only in the nature of a monetary transfer.

4.62 As a result of the development programmes suggested above, output contributed by the forests may be envisaged to increase from the following sources during the coming decade :

- (1) Sale of forest produce from areas clear-felled for teak plantations. This item will be quite substantial.
- (2) Income from thinning of teak plantations.
- (3) Income from bamboo and eta reed resources, which will start accruing by the end of the Third Plan period when all the flowered areas would have been regenerated.
- (4) Income from other plantations would start accruing only towards the end of the coming decade or during the beginning of the Fifth Plan since gestation period before the plantations start maturing is rather long.

4.63 It is difficult to give an exact forecast but taking the above factors into account, the increase in income accruing from forestry during the coming decade is taken to be as follows. It is assumed that income at the end of the Second Plan, that is, during 1960-61 would be 10 per cent higher than that in 1955-56, in 1965-66 twenty per cent higher than that in 1955-56 and by 1970-71 it would be one and a half times the income in 1955-56. On this basis projections for State income from forestry would

¹ The Third Plan has allotted Rs. 9.75 crores for Forest Development which compares quite favourably with investment suggested by us. However, it has to be kept in mind that our figure does not include finances for acquiring private forests, which the State Plan has to provide for.

FORESTS

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be as follows :

	Rs. crores
1955-56	3.0
1960-61	3.3
1965-66	6.0
1970-71	7.3

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4.64 It will be noticed that in the earlier period income is projected to grow at a lower rate than towards the end of the period. This is naturally to be expected in view of the fact that gestation period for growth of forest potential is rather long and the effects of the development programmes will start becoming visible only towards the end of the Fourth Plan period and during the Fifth Plan period. During the Second and Third Plan periods rise in income is expected only from clear felling areas for teak plantations and intermediate felling in the older areas.

Appendix 5

Lists of Trees and other Produce Found in Kerala Along with their Present Uses

E denotes Evergreen; D denotes Deciduous; H denotes Hardwood; S denotes Softwood

Malayalam name	Botanical name	E D	S H	Uses
1	2	3	4	5
1. Teak	<i>Tectona grandis</i>	D	H	Construction, furniture
2. Mathi (Thambura)	<i>Terminalia tomentosa</i>	D	H	Construction, sleepers, etc.
3. Marudhi	<i>Terminalia paniculata</i>	D	H	-do-
4. Venak	<i>Lagerströmia lanceolata</i>	D	H	Boat-building, ceilings
5. Veng	<i>Pterocarpus marsiprum</i>	D	H	Building construction good substitute for teak
6. Manjakadamba	<i>Adina cordifolia</i>	D	H	Bobbins and furniture
7. Ruzuvud	<i>Dalbergia latifolia</i>	D	H	Furniture, plywood, export size above 72" midgirth
8. Chaduchi (U'mam)	..	D	H	Furniture
9. Kunni-aga	<i>Albizia odoratissima</i>	D	H	Building construction
10. Ayiri or (Anjili)	<i>Artocarpus hirsuta</i>	E	H	-do-, Good substitute for teak, boat-building furniture
11. Irinbagan or (Nango)	<i>Mesua Ferrea</i>	E	H	Sleepers
12. Mahogany	<i>Swietenia odorata</i>	E	H	Furniture
13. Wattle	<i>Azadirachta indica</i>	D	H	Being introduced for tan bark
14. Ambesham	<i>Spondias mangifera</i>	D	S	Packing cases
15. Choni	<i>Tetrameles nudiflora</i>	E	S	Packing cases
16. Mani Marathi	<i>Lagerströmia speciosa</i>	E	S	Building construction
17. Charapina	<i>Hardwickia binata</i>	D	H	Packing cases, plywood
18. Chuvungil	<i>Cordia toona</i>	D	H	Furniture

(Continued)

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[PP 313-328 not processed]

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Appendix 3 (Continued)

1	2	3	4	5
19. Mole	<i>Dendroctonus</i>			Bamboos for cheap housing, raw material for paper and rayon
20. Pale	<i>Albizia scholaris</i>	E	S	Packing cases
21. Peel	<i>Xylia Xylompa</i>	D	H	Railway sleepers, building construction
22. Kelpies	<i>Dipterocarpus indicus</i>	E	S	Plywood
23. Keras	<i>Cassia fumea</i>	D	S	Tanning
24. Vallangil (white cedar)	<i>Dysoxylum malabaricum</i>	E	H	Plywood and furniture
25. Nallika	<i>Phyllanthus emblica</i>	E	H	Fruits for pickling and for Ayurvedic medicines
26. Maravatti	<i>Hydnocarpus wightiana</i>	E	H	Soap-making, oil used for lighting purpose
27. Ela veel	<i>Ocotelea Transversaria and Roodi</i>			Raw material for paper
28. Padiri	<i>Strombosium Chelamidi</i>	E	S	Packing cases
29. Pillaru	<i>Artocarpus integrifolia</i>	D	H	Building construction, boat-making, furniture, etc.
30. Puala (Elauro)	<i>Solanum Malabaricum</i>	D	S	Matchwood, cotton seed for pillows
31. Pucum	<i>Schleichera trijuga</i>	D	H	For lac cultivation
32. Pucua	<i>Calophyllum tamariscifolium</i>	E	H	Plywood and cheap timber for construction purposes
33. Kandiyeem	<i>Hopsea parviflora</i>	E	H	Building construction, sleepers, etc.
34. Vakkai	<i>Strobilium Foliace</i>			Camber Bark (fibre) used for making ropes for timber dragging purposes
35. Chelala	<i>Colonia malabarica</i>	E	S	Plywood
36. Vallapies	<i>Vateria indica</i>	E	S	A favourite plywood species
37. Muthi	<i>Alseodaphne malabaricum (muthi)</i>	D	S	Matchwood
38. Pali	<i>Palasium Ellipticum</i>	E	S	Plywood
39. Kalamau	<i>Machilus Marcantha</i>	E	S	-do-
40. Mava	<i>Mangifera indica</i>	E	S	Plywood, boat-building, packing cases
41. Kalamukha	<i>Anacardium daniellii</i>	E	S	Plywood
42. Kaperi (chava)	<i>Colonia malabarica</i>	E	S	-do-
43. Shavil	<i>Rhuschickia Pinnata</i>	E	S	-do-

(Continued)

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APPENDICES

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Appendix 3 (Continued)

1	2	3	4	5
44. ...	<i>Eucalyptus grandis</i>	E	S	Pulp timber
45. Blue gum	<i>E. Globulus</i>	E	S	Pulp timber
46. Cashew	<i>Anacardium occidentale</i>	E	H	Nuts and apple
47. Kahola	<i>Terminalia Chedula, and heterica</i>	D	H	Myrobalans
48. Pannappamaram	<i>Delnia pantagyna</i>	D	H	House construction
49. Vekkali	<i>Anegritia latifolia</i>	D	H	Mine props
50. Nedmar	<i>Petalithia fragrant</i>	E	S	Masts and packing cases
51. Nedmar	<i>Petalithia fragrant</i>	E	H	Cabinet-making and furniture
52. Malacappa	<i>Chakrasia tubularis</i>	E	H	-do-
53. Chankurathi	<i>Elatracoceria</i>	E	H	-do-
54. Vudotto	<i>Lophopetium wightianum</i>	E	S	Plywood
55. Pali	<i>Tamarindus indica</i>	D	E	Fruit good glue material, Bob- bins
56. Asal	<i>Heloptelea integrifolia</i>	E	S	Box and packing cases
57. Black dammar	<i>Canarium strictum</i>	E	S	Packing cases
58. Papitta	<i>Sterculia compaulata</i>	E	S	Matchwood, packing cases
59. Kamli (Nasakam)	<i>Erodia ruthurghiana</i>	E	S	Matchwood
60. Vella Kamadamba	<i>Hydnodictyon carlia</i>	D	S	Bobbins
61. Puroorva	<i>Thespesia populnea</i>	D	H	Shuttles
62. Dotapala	<i>Wightia tinctoria</i>	D	H	Combs, and carvings
63. ...	<i>Gmelina arborium</i>	D	H	Musical instruments
64. Pungu	<i>Pongamia glabra</i>	D	H	Oil seeds
65. Malayini	<i>Bridelia retusa</i>	D	H	Tans and dyes
66. Chanda	<i>Caulpinia sappan</i>	D	H	Dyes
67. Udi	<i>Odina woodii</i>	D	H	Gum used for curving fishermen's nets

Source: Department of Forests, Government of Kerala.

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351 useful for cookery are watered and grown in the compound itself; while during the rains also vegetables are grown, such as brinjals, lady's fingers, pumpkins, peas, etc. During summer the trees and vegetables in the compound are watered from the well which is a special feature of every house.

242 *Insect-pests.*—The caterpillars of certain moths ate away this year (1916) the tender blades of the paddy as soon as they cropped up from underground. This appeared at the beginning of the sowing season (May) and lasted for a week or two. Farmers here say that these have not appeared for years past. When I wrote to the Agricultural Superintendent of the State at Trichur he suggested the following remedy: "Dig a trench $\frac{1}{2}$ foot wide by $1\frac{1}{2}$ feet deep along the four sides of a field where these insects would fall in their travel from field to field, but would not be able to get out of it."

A kind of fly or flea is said to eat away the juice of the rice at the stalk of the paddy as soon as it reaches the milk stage.

232 *Cattle diseases.*—Sore feet. The feet are well washed with hot water, and turpentine, teak-oil, or cashewnut oil is smeared in the sore; the animal is also made to stand in a muddy place into which the leaves of a certain tree are strewn.

Mouth disease. Pig-ghee or bear-ghee is smeared on the tongue.

Swelling in the belly. The animal without any apparent cause falls down and dies. No medicine is applied in such cases.

Malignant sore-throat and cow-pox are also common.

[654] An Agricultural Department for the State has been established recently at Trichur with a model farm attached to it. The present Superintendent is an England-returned Cochinite. Help is often derived from here, but the farmers themselves are shrewd in practical agriculture.

● 313 *Timber.*—Wood for fuel, implements, buildings, etc., is obtained from the neighbouring hills and forests. The taluk of Talapilli is full of forests especially on the eastern side. Nearly 43 per cent of the area of the State is forest and its timber is even exported to foreign parts. The Forest Department is a source of income to the State.

[482] Coolies carry faggots of fuel on their heads from the neighbouring hills for sale; sometimes the people get cart-loads; a decent head-load now costs nearly 4 annas and a cart-load from Rs. 2-8-0 to Rs. 3; prices were much lower a few years back. A full head-load is divided into smaller bundles before being sold, and a woman may get six or eight annas for a bundle as heavy as she can carry.

Durable building materials are got from the forests and timber depots, but mango-planks, bamboos and jack-tree planks are also used.

342 *Houses.*—Houses are not built in rows. Every house is surrounded by a compound hedged round by bamboo. Such compounds are intersected by lanes. Rice-straw is used in thatching houses; tiles are replacing thatch but the majority of houses still are thatched. No terraced houses can be seen in these parts where the monsoon rains pour down with full force.

241 leads to the tree fruiting within two or three years, instead of four or five. The leaves that fall from the trees in gardens are used as green manure in the paddy fields and coconut gardens. No such thing as growing green manure is known. No wood or forest is near so that the people may bring the leaves.

242 In fact very little manuring takes place in the village. What is actually done in the cultivation of chief crops is to plough the land. Every year much is drawn from the soil, and nothing is returned to it. I have stated above that lands which returned Rs. 1,000 a year do not now return more than Rs. 400 or 500. The two most potent causes for this deterioration are the system of land tenure and the absence of manuring. Perhaps the second is the result of the first, but I think the want of agricultural knowledge is the cause of the want of manuring and scientific cultivation.

372 *Wood and fuel.*—The outer cover of the coconut, the leaves of the same, mango trunks, serve for fuel for the whole village, and they are obtained in plenty, but the price is rising with the general rise of prices.

• [313] *Wood for implements, building, etc.,* is obtained from Cochin State, brought in carts drawn by oxen or buffaloes.

342 *The village—Houses.*—For buildings granite is obtained from a place four miles distant, mortar is prepared in the village, mud from the village itself, tiles from different places, the least distant being twenty miles away, for thatch the leaves of the coconut are used, iron things are bought in the bazaar. The houses in the village are all isolated from one another. Every part of the village is inhabited except the paddy fields. However, at the present day traders have a tendency to build their houses as near the road as possible and form streets. The people also have a tendency to live as near the temple as possible, and this has resulted in the formation of four streets, surrounding the temple on all the four sides. These streets form also the bazaar of the village. There are here about 100 houses.

361 The lands adjacent to the temple are occupied by Brahmans and Nayars. Any other place can be occupied by any family. The houses of the low castes, high castes, and of other religions are intermingled. The same garden may be occupied by Muhammadans, Hindus and Christians, and they all live very amicably as if they belonged to one and the same religion.

735 The Pariahs, whose families are only three in number, occupy certain portions of the land of a big landlord. The landlord gives the Pariahs free houses and a certain allowance a month. He thinks it incumbent upon him to protect and maintain them. Their huts, though small, are yet tidy and neat. The allowance that was freely given them has now become a right. They follow certain industries and go to rich men's houses to beg twice a month, and they are given a certain quantity of rice.

342 There are 977 thatched houses, 313 tiled houses, no terraced houses.

286 *Crafts and industries.*—There are seven families of weavers consisting of 39 members, i.e., 14 men, 12 women, 13 children under fifteen years. They have been in the village from times long past. They weave a cloth 1 foot wide, $1\frac{1}{2}$ yards long, and this is used as undercloth. They also at times weave a cloth $\frac{3}{4}$ or 1

use. No other manure is used. Green manure is not grown but is got from somewhere or other according to circumstances. Varatties are not made. Wood fuel is the only sort used.

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[372]

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Insect pests.—Of these, the most ruinous is the "Chazhi" the terror of the ryot. The chazhi is a small insect of the locust species half an inch long which in millions appear in a few seasons and spread desolation in the paddy fields. Two remedies are current against this pestilence: (1) catching them directly by drawing a cloth (which serves the purpose of a net) attached to two handsticks over the crops and thus killing them; (2) but by far the most efficacious remedy in the estimation of the cultivator is the putting of a talisman in the fields which a local conjurer (Mandravadi) has prepared for him. What chazhi is to paddy "Mahali" is to the arecanut, the only difference being that in this case nothing is believed to be possible to combat the calamity.

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Cattle diseases are (1) hoof disease, (2) Koraladappan (swelling in the neck), (3) Thada (mumps), (4) obstruction of urine and dung, (5) sudden epileptic attacks, and other diseases whose causes and cure are unknown to the peasant. Poisoning is sometimes done by Paraiyas of neighbouring desams for the sake of getting the flesh. For beef is eaten only by this lowest class and when cattle die they will be called to remove the carcase. A number of cattle are annually destroyed by tigers also which often venture into the sheds of the peasants. Talismans and offerings to deities are conceived to be the only remedy.

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No assistance is obtained from the Agricultural department, nor any from any veterinary doctor.

Wood is commonly got for all uses from private trees; but the forest also supplies sometimes wood for small necessities. For building purposes, wood is purchased—not from any fixed place.

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Houses.—The depressed castes have miserable hovels for their houses. A mud wall of five feet height with a ruined roof which can protect the inmate neither from sun nor rain is the order of the day.

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Except the palatial family homes of the two jenmis, there are no tiled houses. Terracing is not customary here. All other houses are thatched, and thatching is always of straw.

Most houses have gardens surrounding them, where arecanut trees, plantains, mango trees, jack, etc., are grown. They are joyful to look at.

351

The maximum distance of cultivated lands from the home of cultivator is one mile.

An acre of land costs from Rs. 200 to Rs. 300. But purchases on jenmi tenure are worth above Rs. 500. But it is impossible to acquire jenmam property except for jenmis; for the jenmis are jealous guardians of their lands and never sell lands once acquired. Direct threatenings and indirect intimidation are used by them to obtain the jenmam right of lands if held by any lesser landowner.

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[435]

Subsidiary industries.—Neither weaving nor spinning have ever been practised in this desam.

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Other crafts—

1. Arrack and jaggery making.
2. Ironsmith.

237 (called varatties) and used as fuel to supplement firewood, by the poorer classes, who go about picking the stray deposits of cattle-dung in the by-ways and streets. Perhaps a small percentage of cattle-dung is wasted. Yet it is the most important manure and an acre of land uses 100 to 150 baskets of it.

Cattle urine is not used, except by Brahman ladies to a very small extent, in growing kitchen vegetables in their backyards.

The refuse of goat-pens and of fowls (which are kept in most low-class and Nayar houses), as well as bone dust, is used in small quantities for growing garden vegetables.

241 All sorts of green manure are used. About fifty to seventy-five bales of green stuff are used on one acre of land. But green manure is not grown; it is obtained from the neighbouring woods, and the shrubby undergrowth which is commonly found on almost every hillside and in the compounds of houses.

Wood-ash is commonly used, especially in garden cultivation.

Salt is used in coconut plantations.

Chemical manures are unknown in the village.

Garden cultivation is an important item, and very profitable too, though it is not yet carried on very extensively. About 110 acres of land are used for this purpose. Water is obtained mostly from wells, of which there is one or more in every garden. The chief products are coconuts (selling at Rs. 3 to Rs. 5 per 100), arecanuts used for chewing, etc. (Rs. 1½ to Rs. 2 per 1,000), plantains or bananas (Rs. 5 to Rs. 15 per 1,000), jack-fruits (2 to 6 annas each), mangoes, yams and various kitchen vegetables like pumpkins, brinjals, etc. These are cultivated in almost all gardens. Pepper and ginger, betel leaves and turmeric, are also cultivated in all good gardens. Pepper is very valuable and gives a good profit.

[722] Coconuts being largely exported in the form of copra, have fallen 50 per cent in price, through shortage of freight, during the war. This has entailed great hardship on the large classes of coconut growers and workers in the Malabar Coast, this village suffering with the rest.

242 *Insect-pests.*—A kind of beetle sometimes does great damage to the crops—especially the new paddy crops and plantains. Small birds also carry away grains of corn. The usual method of combating them is to keep watch in the fields and drive them off—a very tedious and difficult operation. No help is got from the Agricultural Department, of whose very existence the village is unaware.

232 *Cattle diseases.*—Hoof disease is the commonest and most dangerous. Kerosene oil mixed with lamp black is the popular remedy. There is another disease—a sort of suffocation. A cholera-like disease is also heard of, accompanied by bleeding, etc. Snake-poisoning is another danger, a bite on the nose being supposed to be fatal. The villagers have their traditional methods of combating these. Charms and incantations are used to supplement medicine. No assistance is obtained from the Agricultural Department.

● 313 *Wood* is obtained from the neighbouring forests, as well as from the clusters of trees in the village. Building timber is often

- 313 purchased from the nearest markets and brought in carts. Wood is getting dearer and dearer. It used to be very cheap.

The increase in price is due to the felling of trees without replanting, increased outside demand for fuel, as by the railway company and the Shoranur Tile Works; and the better appreciation and consequent increased demand for the local timber trees.

- 361 *The village.*—Strictly speaking there is no village-site. The houses are not built in street formation, but are scattered throughout the village. This is characteristic of most villages in Malabar and strongly contrasts with what obtains in other districts. The area of the village is 2,380 acres.

Localization of castes is not complete. Brahmans are located in the centre around the temple, with the Nayars, and the other higher castes surrounding them. The Thiyyas or Ezhuvas live farther apart and the depressed classes—Cherumas, Pariahs, etc.—live far out of the way of the higher castes on the outskirts of the village in hovels on hill sides, which are unfrequented by the other castes. Of course there are social prohibitions to their approaching the higher castes, much more to living near them.

- 342 There are a few fine houses: about 20 are tiled and have two storeys, about half of them belonging to the Brahmans. About 100 are one-storeyed thatched houses, almost exclusively owned by the castes. The rest are mere huts used by the poorer classes. There is no terraced house at all. Most of the houses are pretty old, but the tiled ones are mostly of recent construction. The houses are built more or less on a uniform plan and are often large without being convenient or comfortable.

The Pariahs and Cherumas live in thatched huts, miserable hovels one should call them, small, dark and exposed.

- 351 Almost every house has a 'garden' of some sort, with a few fruit trees like the coconut-palm, the mango tree, the jack tree, the areca-palm, plantain trees, etc. But very few houses have really good gardens. The gardens are watered from wells, which are found in every house. Whether there are fruit-trees on it or no, each house of the better class has a compound attached to it. This is sometimes used for growing kitchen vegetables.

- 361 The distance of cultivated lands from the home of the cultivator is never more than one mile. In the working season the ryot starts very early in the morning from his home with his oxen and agricultural implements so as to reach his land in time.

- 343 Field huts are almost unknown—except tiny watchmen's huts where watch is kept by a man at night when the crops are getting ready for harvest.

- 323 *Subsidiary industries—Potters.*—There are no weavers. There is a class of potters, of Telugu origin (as their language shows) engaged in making pots for household use, etc. They get the clay for their industry from the banks of the Bharata river (situated to the south of the village). Their wares find a ready market in the neighbouring villages, being very cheap and necessary. The lower castes cook in pots of burnt clay, while the better classes use bronze and other metals, such as copper. The art is the whole time employment of this class. But earnings are not very high, only just affording the means of subsistence. If the art is refined and improved to suit modern conditions and requirements it